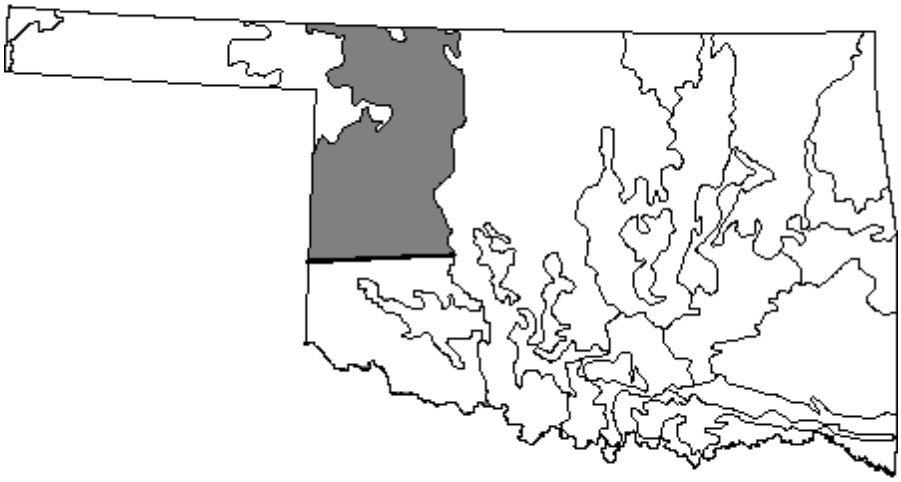
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION
Rangeland



ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: 078CY065OK

Site Name: Clay Prairie (North)
(Blaine, Caddo, Major, Woods, and Woodward Counties)

Precipitation or Climate Zone: 22-28 inches (avg.)– MLRA 78C (Central Rolling Red Plains) Mean Annual Soil Temperature 57 - 64 degrees.

Original Site Description Approval:

Site Date: 12/15/60

Site Author: Unknown

Site Approval Date: 12/60

Revisions:

Revision Date: January 2001

Reviser: John W. Mustain

Revision Approval: Mark Moseley

Physiographic Features

Narrative: Broad gently sloping to steep ridgecrests and sideslopes of hills on uplands.

Land Form: (1) Hills on uplands

Aspect: (1) Not Applicable

	Minimum	Maximum
Elevation (feet):	1001	2500
Slope (percent):	1	20
Water Table Depth (inches):	>96	>96
Runoff Class:	Very High	
Flooding	None	
Flooding Frequency	None	
Flooding Duration	None	
Ponding	None	
Ponding Depth	None	
Ponding Frequency	None	
Ponding Duration	None	

CLIMATIC FEATURES

Narrative: The weather is alternately influenced by cold dry air from the Arctic Circle, and warm moist air from the Gulf of Mexico. Seasonal changes are gradual. Spring is a season of variable weather and relatively high precipitation with prevailing winds from the southwest. Summers are generally hot with low humidity. Fall has long periods of pleasant weather interspersed with moderate to heavy rains. Winter is open and moderate to cold with winds from the north and infrequent snows. Approximately 75 percent of the rainfall occurs during the warm season, and much of it comes in storms of high intensity and short duration in May and June. These rains are particularly erosive on this site (especially where vegetation is sparse). Occasional droughts are to be expected. Lack of rainfall and hot, dry winds often curtail forage production during July and August.

		Minimum	Maximum
Frost-free period (days):	(4/12 - 10/17)	188	198
Freeze-free period (days)	**(**4/1-10/31)	213	222
Mean annual precipitation (inches):		12.6	29.91

Monthly moisture (inches) and temperature (^{0}F) distribution:

	30% Avg. Min.	Avg.	30% Avg. . Max.	Avg. Daily. Min.	Avg.	Avg. Daily. Max.
January	.18	.54	.65	21	35	49
February	.39	1.03	1.24	27	41	56
March	.66	1.82	2.26	35	49	64
April	1.24	2.05	2.49	46	60	75
May	1.78	3.96	4.83	55	69	82
June	2.33	3.18	3.73	64	77	90
July	1.48	2.6	3.21	69	82	96
August	1.44	2.78	3.39	67	80	94
September	1.11	2.25	2.75	59	72	85
October	.85	1.87	2.31	47	61	76
November	.48	1.36	1.71	35	48	61
December	.36	.84	1.04	25	38	52
Totals	12.6	24.28	29.91			

			Period	
Climate Stations:	**Station ID**	**Location**	**From:**	**To:**
Woodward	OK9760	Woodward	**1948**	**1999**

REPRESENTATIVE SOIL FEATURES

Narrative: This site includes reddish calcareous clayey soils of the gently sloping to rolling uplands. Surface soils are reddish brown clay 6 to 12 inches thick over red calcareous clay that grades to relatively un-weathered Permian clay beds at 10 to 40 inches below the surface. Surface soils are granular to fine blocky in structure. Permeability is very slow. Much moisture is lost through runoff and the soil is not normally moistened below 15 to 20 inches.

Parent Material Kind: Claystone
Parent Material Origin: Permian Redbeds
Surface Texture: Clay loam, silty clay, clay, silty clay loam.
Surface Texture Modifier: None
Subsurface Texture Group: - Clay, silty clay, weathered bedrock.
Subsurface Fragments >3" (%Volume): - None

	Minimum	Maximum
Drainage Class:	Well drained	
Permeability Class: Slow	0.06	0.20
Depth (inches):	20.00	40.00
Electrical Conductivity (mmhos/cm):	0.00	2.00

Sodium Absorption Ratio:	0.00	15.00
Soil Reaction (1:1 Water):	7.9	8.4
Soil Reaction (0.1M CaCl2):	-	-
Available Water Capacity (inches):	2.0	5.3
Calcium Carbonate Equivalent (percent):	0.00	50.00

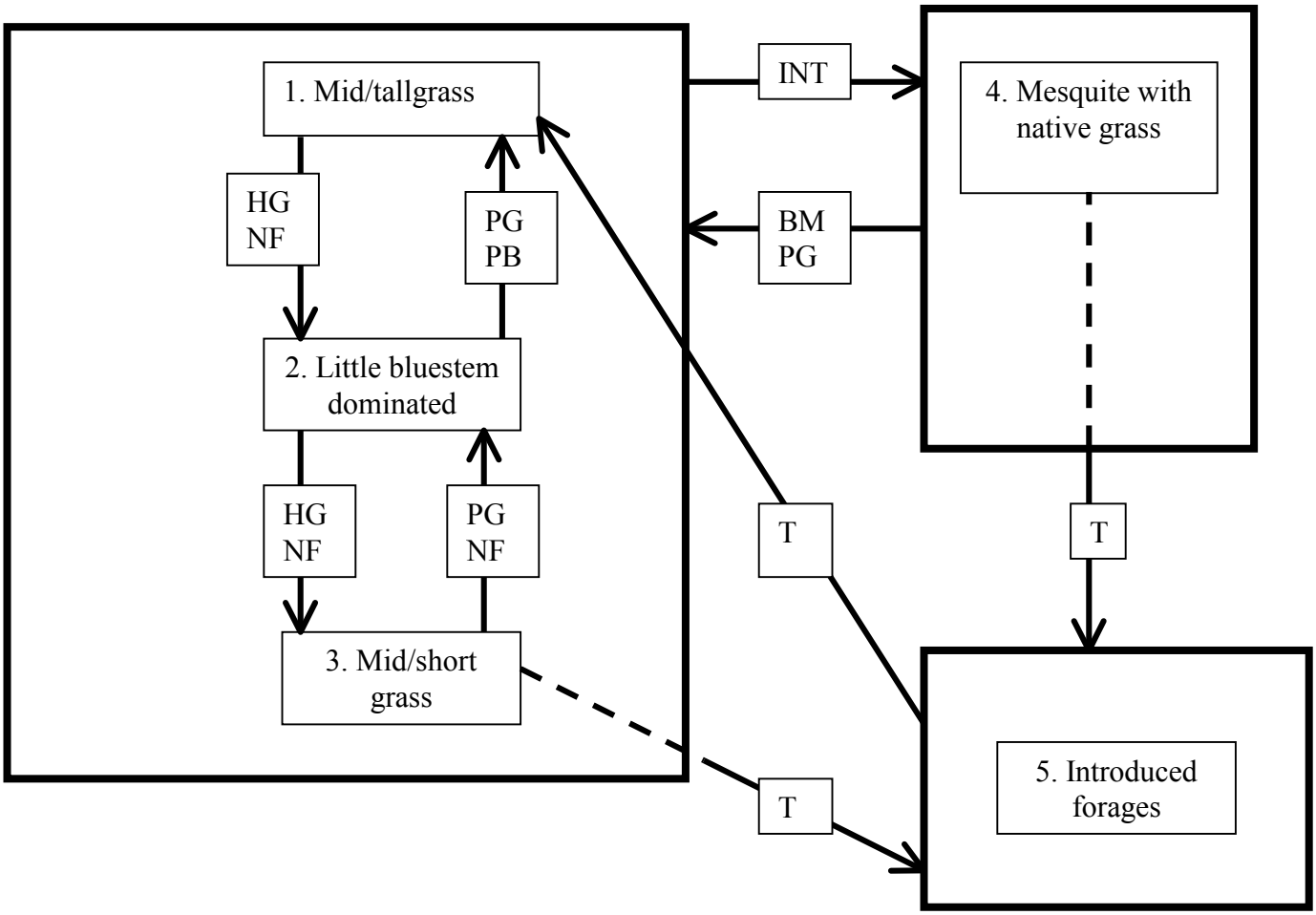
REPRESENTATIVE SOILS - Vernon

PLANT COMMUNITIES

Ecological Dynamics of the Site:

The aspect of this site is one of tall grasses with component of mid and short grasses depending upon management. Several plant communities can exist on the site. The significant plant communities are a tall/midgrass, little bluestem dominant, little bluestem with mesquite, and a mid/short grass community.

Plant Communities and Transitional Pathways Diagram



Legend:

- **Thresholds** - Once the vegetation composing the plant community, changes to the point that it requires accelerating measures such as mechanical treatment, reseeding, chemical treatment, etc., to return to the prior vegetative state, it is considered to cross a threshold.

- **Pathway** - Indicates that measures can be taken to prevent crossing a threshold. Management type practices such as grazing management and facilitating practices such as fencing and water development are examples of these measures.

NF - No Fire
PG – Prescribed Grazing
HG – Continuous Heavy Grazing
BM – Brush Management
PB – Prescribed Burning
INT - Seeds are introduced to site
T - Tillage and replanting

Plant Community Name: Mid/tallgrass
Plant Community Sequence Number: 1

Plant Community Narrative:
This mid/tallgrass plant community is presumed to closely resemble the original plant community that existed on this site prior to European settlement. This site consists of an open mid/tall grass prairie with some shortgrass species. Other important grasses include sideoats grama, buffalograss, big bluestem, switchgrass, and some Indiangrass. This site also supports a variety of forbs, including catclaw sensitivebrier, heath aster, dotted gayfeather, and others. The main low successional species is silver bluestem. Shrub types are generally non-existent except for an occasional pricklypear cactus. This plant community has evolved through the collective influence of fire, herbivory, drought, and extremes of temperature. Primary herbivory occurred from seasonal migration of bison and elk.

Continuous heavy grazing and an absence of fire on this site will tend to decrease grasses such as big bluestem, Indiangrass, and switchgrass as well as palatable legumes. A corresponding increase of little bluestem will replace the palatable big bluestem and Indiangrass. The rate of development of the little bluestem dominant community is dependent upon stocking rate, fire frequency, and season. Prescribed grazing with prescribed burning on a 3 - 5 year interval will restore and maintain a component of tall grasses, legumes, and forbs. No grazing or fire will result in litter build-up and some stagnation of ecological function.

Plant Community Annual Production (by plant type):

	Annual Production (lbs./ac)		
Plant Type	**Low**	**RV**	**High**
Grass/Grasslike	930	1460	1980
Forb	50	90	110
Shrub/Vine	20	50	110
Litter	250	1300	2500
% Bare Ground	5		

Plant Community Composition and Group Annual Production:

Plant Type – Grass/Grasslike (1460 lbs./ac.)

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	SCSC	little bluestem	466	612
1	BOCU	sideoats grama	146	
2	ANHA	big bluestem	219	438
2	PAVI2	switchgrass	146	
2	SORGH	Indiangrass	73	
3	BOGR2	blue grama	146	219
3	BUDA	buffalograss	73	
4	ELCA4	Canada wildrye	30	118
4	AGSM	western wheatgrass	30	
4	PAOB	vine-mesquite	58	
5	BOSA	silver bluestem	73	73

Plant Type – Forb (90 lbs./ac.)

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
6	SCHUH2	catclaw sensitivebrier	15	90
6	DEIL	Illinois bundleflower	15	
6	ASER3	heath aster	15	
6	LIPU	dotted gayfeather	15	
6	DAPUP	purple prairieclover	15	
6	ASCR2	groundplum milkvetch	15	
6	AMDR	common broomweed	15	

Plant Type – Shrub/Vine (50 lbs./ac.)

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
7	OPUNT	pricklypear cactus	50	50

Plant Growth Curves

Growth Curve ID: 01
Growth Curve Name: Native warm season grasses
Growth Curve Description: Mid-tallgrass community with normal year growing conditions.

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	1	3	8	20	30	15	6	10	5	2	0

OTHER VEGETATIVE STATES

Plant Community Name: little bluestem dominance
Plant Community Sequence Number: 2

Plant Community Narrative:

This site is dominated by little bluestem, comprising approximately 60 - 85 percent of the total annual production for the site, with a small percentage of other perennial grasses such as silver bluestem, sideoats grama, and buffalograss. Continuous grazing and absence of fire contributes to the dominance of little bluestem, which happens more quickly as stocking rates increase. In years of dry summers followed by cool, mild winters, common broomweed will be present on the site.

Applying prescribed grazing and prescribed fire will shift the competitive balance and allow an expression of big bluestem, Indiangrass, switchgrass, forbs, and legumes. This shift can occur in 2 - 5 years depending upon rainfall and grazing management.

Plant Community Name: Mid-shortgrass community
Plant Community Sequence Number: 3

PICTURE CURRENTLY NOT AVAILABLE

Plant Community Narrative:

This plant community is predominately midgrasses with some little bluestem. The dominant grasses are sideoats grama, blue grama, buffalograss, and silver bluestem and some threeawn. This plant community is a result of long-term heavy continuous grazing. There is usually a remnant of little bluestem and other grasses that will eventually respond to prescribed grazing. The time needed to return to a little bluestem dominated community can be 5 - 10 years depending on rainfall, stocking rate, and management.

Plant Community Name: mesquite with native grass
Plant Community Sequence Number: 4

Plant Community Narrative:
This site consists of a little bluestem dominated grassland with mesquite. The mesquite can significantly reduce grass production. Mesquite, which can reach 10 to 30 percent canopy, has been introduced to the site. Mesquite can increase on this site for a variety of reasons. Importation of cattle that have grazed on mesquite beans can undoubtedly introduce new seed to the site. Moreover, seeds that pass through the digestive tract of an animal have enhanced germination rates.

The chances for mesquite to establish are greatest when high rainfall follows periods of extended drought. Drought, by resulting in patches of bare ground, provides openings for mesquite to

establish. Continuous heavy grazing, that removes grass competition, will speed up the establishment and rate of spread of mesquite.

Once mesquite is introduced and has established on the site, significant intervention from chemicals, or mechanical means must be utilized to remove it. Fire has limited effect on mesquite other than to maintain a low stature and slow its' spread. The budzone of seedling mesquite goes below ground during the first year and is resistant to fire. The time needed from the time of first introduction of mesquite until a 20 percent canopy can be as much as 25 years. This will occur more quickly in the southern portion of the site than the northern portion.

Plants such as broomweed and pricklypear cactus will also occupy this site.

In years of dry summers followed by cool, mild winters, common broomweed will be present on the site. The occurrence of common broomweed is more frequent when there is heavy grazing.

Applying brush management to mesquite along with prescribed grazing will restore a community dominated by little bluestem. Prescribed grazing and prescribed burning will increase species such as big bluestem, Indiangrass and switchgrass.

Plant Community Name: Introduced grasses
Plant Community Sequence Number: 5

Refer to appropriate Forage Suitability Groups.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community: This site is useful for cattle. The presence of mesquite on the site provides moderate habitat for whitetail deer in the form of cover. Quail utilize the low growing mesquite limbs to hide from aerial predators and for thermal cover. Mesquite seeds are a food source for wildlife species such as squirrel, coyote, skunk, etc. The beans are also relished by livestock, which contributes to its spread. Beans that drop on the ground under the mesquite do not germinate as successfully as do the seeds that pass through the digestive tract of an animal. Little bluestem is a preferred nesting plant for bobwhite quail. Bobwhite quail benefit during years when common broomweed is present, although this makes the site less desirable for cattle grazing.

Hydrology Functions: The soils occupying this ecological site are shallow and somewhat excessively drained, with slow permeability. Runoff is rapid.

Recreational Uses: Hunting, camping, horseback riding

Plant Preference by Animal Kind:

Forage preference: (P = Preferred, D = Desirable, U = Undesirable)
(Dash [-] implies dormancy or unavailable during this month)

Animal Kind: Domestic Livestock

Animal Type: Cattle

Common Name	Scientific Plant Symbol	Plant Part	Forage Preferences J	F	M	A	M	J	J	A	S	O	N	D
little bluestem	SCSC	Leaves	D	D	D	P	P	P	P	D	D	D	D	D
sideoats grama	BOCU	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
big bluestem	ANGE	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
switchgrass	PAVI2	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
Indiangrass	SORGH	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
blue grama	BOGR2	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
buffalograss	BUDA	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
Canada wildrye	ELCA4	Leaves	P	P	P	P	P	-	-	-	P	P	P	P
vine-mesquite	PAOB	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
silver bluestem	BOSA	Leaves	U	U	U	D	D	D	D	U	U	U	U	U
catclaw sensitivebrier	SCHUH2	Leaves	-	-	-	P	P	P	P	P	P	P	-	-
Illinois bundleflower	DEIL	Leaves	-	-	-	P	P	P	P	P	P	P	-	-
heath aster	ASER3	Leaves	-	-	-	-	-	-	D	D	D	D	-	-
dotted gayfeather	LIPU	Leaves	-	-	-	-	-	-	D	D	D	D	-	-
purple prairieclover	DAPUP	Leaves	-	-	-	-	D	D	D	D	D	-	-	-
groundplum milkvetch	ASCR2	Leaves	-	-	-	P	P	P	P	D	-	-	-	-
pricklypear cactus	OPUNT	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
common broomweed	AMDR	Leaves	U	U	U	U	U	U	U	U	U	U	U	U

Plant Preference by Animal Kind:

Value for white-tailed deer
(C = Cover, P = Preferred forage, D = desirable forage, U = Undesirable forage)
(Refer to habitat appraisal guides for more specific guidance.)
(Dash [-] Implies dormancy or unavailable during this month.)

Animal Kind:

Animal Type: Deer

Common Name	Scientific plant Symbol	Plant Part	Forage Preferences J	F	M	A	M	J	J	A	S	O	N	D
Tall grasses	-	All	U	U	U	C	C	C	C	U	U	U	U	U
Mid and short grasses	-	All	U	U	U	U	U	U	U	U	U	U	U	U
mesquite	PRGL2	All	C	C	C	D	D	C	C	C	C	C	C	C
catclaw sensitivebrier	SCHUH2		-	-	-	P	P	P	P	P	P	P	-	-
Illinois bundleflower	DEIL	Leaves	-	-	-	P	P	P	P	P	P	P	-	-

Plant Preference by Animal Kind:
Value for quail
(C = Cover, N = Nesting cover F = Food, U = Unused)
(Refer to habitat appraisal guides for more specific guidance.)
(Dash [-] Implies dormancy or unavailable during this month.)

Animal Kind:
Animal Type: Quail

	Scientific plant Symbol	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Bunchgrasses	-	All	C	C	C	N	N	N	N	N	C	C	C	C
mesquite	PRGL2	All	C	C	C	C	C	C	C	C	C	C	C	C
catclaw sensitivebrier	SCHUH2		-	-	-	F	F	F	F	F	F	F	-	-
Illinois bundleflower	DEIL	Leaves	-	-	-	-	-	F	F	F	F	F	F	F
Short/mid grasses	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Small seed producing plants	-	Seeds	-	-	-	F	F	F	F	F	F	F	F	F
Prickly pear	OPUNT	Pads	C	C	C	C	C	C	C	C	C	C	C	C
common broomweed	AMDR	All	C	C	C	C					C	C	C	C

SUPPORTING INFORMATION

Associated sites:

Site Name	Site ID	Site Narrative
Gyp	078CYO38OK	

Similar sites:

Site Name	Site ID	Site Narrative
Shallow clay prairie	078CY066OK	

Inventory Data References (narrative):
Information presented here has been derived from limited NRCS clipping data and the field observations of rangeland trained personnel. Additionally, range scientists from Oklahoma State University and the Agricultural Research Service have contributed scientific data.

Inventory Data References:

Data Source	# of Records	Sample Period	State	County
417	7	10/81-10/87	Oklahoma	Woods

State Correlation:

Type Locality:

State: Oklahoma

County: Woodward

Latitude:

Longitude:

Township: 23N

Range: 17W

Section: 10

Is the type locality sensitive? (Y/N): Y

General Legal Description:

Site Genealogy

This site was previously called Red Clay Prairie.

Site Reviewers and Contributors

Dr. Bob Gillen, ARS, South Plains Range Research Station, Woodward, OK

Dr. Terry Bidwell, OSU, Extension Range Specialist, Stillwater, OK

John Mustain, NRCS, Area Resource Specialists, Woodward, OK

Mark Moseley, NRCS, State Range Conservationist, Stillwater, OK

Site Approval:

_____ _____

Assistant State Conservationist (ES) Date

_____ _____

State Range Conservationist Date